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Abstract

Solar System Exploration in the Next Decade

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A major change is taking place in the approach to the exploration of our Solar System. Advanced technology is becoming more central to a bold strategy of frequent highly capable missions with ambitious objectives such as: in situ and subsurface exploration, sample return, surface and atmosphere mobility, cooperative networks, high speed travel.

The overarching scientific theme for the next decade is to better understand the building blocks of the solar System and the associated prebiotic chemistry with the hope of understanding the potential of past or future evolution of life. This goal has led to a strategy of a series of missions to study and sample comets, probe the surface of Europa in search of subsurface oceans, explore the surface and immediate subsurface of Mars, return samples from Mars, comets, asteroids, solar wind and possibly other bodies for detailed analysis, and map Pluto and its satellite Charon.

In order to achieve these missions within the next decade, a major investment is being undertaken in developing and demonstrating advanced miniaturized S/C (flying PC), highly capable propulsion system (electric propulsion and solar sails), highly efficient telecommunication networks (interplanetary internet), autonomous mobile systems (rovers, gliders and balloons) and light weight efficient sensors.

This talk will give an overview of NASA Planetary Exploration strategy for the next decade and describe the technological advances which are needed and envisioned to make this strategy successful.